In the United States Patent and Trademark Office

Appellants:	Mark G. Reichmann et al.	Docket No.:	17,142
Serial No.:	10/734,006	Group:	1771
Confirmation No:	9434	Examiner:	Matthew D. Matzek
Filed:	December 10, 2003	Date:	September 6, 2006

For: HIGH STRENGTH NONWOVEN WEB FROM A BIODEGRADABLE ALIPHATIC POLYESTER

Revised Brief on Appeal to the Board of Patent Appeals and Interferences

Mail Stop Appeal Brief - Patents
Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Notice of Non-Compliant Amendment mailed August 17, 2006, Appellants respectfully submit this revised Brief in support of their Appeal of Examiner Matzek's **Final Rejection** of claims 1-28 which was mailed on January 30, 2006.

On May 1, 2006, Appellants, pursuant to 37 C.F.R. 41.31 mailed a timely Notice of Appeal. Thus, the time period for filing this Brief ended on July 3, 2006. Appellants submitted a one (1) month extension of time and filed an Appeal Brief on August 1, 2006.

Real Party in Interest

The present Application has been assigned to the Kimberly-Clark Worldwide, Inc.

Related Appeals and Interferences

There are no known related appeals or interferences.

Status of Claims

Claims 1-28 remain in the application with claims 1-28 being finally rejected. No claims have been withdrawn or cancelled.

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Status of Amendments

No Amendment After Final Rejection has been submitted.

Summary of Claimed Subject Matter

The following concise explanation of the subject matter defined in each of the independent claims involved in the appeal refers to the page and line numbers of the Specification and the Figures filed on December 10, 2003.

Independent claim 1 of the present invention is directed to a biodegradable nonwoven web prepared from an aliphatic polyester polymer blend having from about 65% by weight to about 99% by weight of a biodegradable aliphatic polyester polymer **(See, for example, page 2, lines 24-27 of the Specification)** and from about 1% by weight to about 35% by weight of a second polymer **(See, for example, page 2, line 28 of the Specification)** which is amorphous **(See, for example, page 7, lines 32-33 of the Specification)** selected from the group consisting of a polymer having a lower melting point than the biodegradable aliphatic polyester polymer and mixtures thereof **(See, for example, page 2, lines 29-31 of the Specification)**.

Independent claim 25 of the present invention is directed to a method of increasing the tear strength of a biodegradable nonwoven web prepared from a biodegradable aliphatic polyester polymer **(See, for example, page 3, lines 11-12 of the Specification)**. The method includes forming a blend of a biodegradable aliphatic polyester polymer and a second polymer which is amorphous selected from the group consisting of a polymer having a lower melting point than the biodegradable aliphatic polyester polymer **(See, for example, page 3, lines 13-15 of the Specification)**, a polymer having a lower molecular weight than the biodegradable aliphatic polyester polymer and mixtures thereof **(See, for example, page 3, lines 15-16 of the Specification)**, forming a nonwoven web from the blend and bonding the nonwoven web **(See, for example, page 3, lines 16-17 of the Specification)**.

Independent claim 26 of the present invention is directed to a fiber from a polymer blend including from about 65% by weight to about 99% by weight of a biodegradable aliphatic polyester polymer **(See, for example, page 3, lines 3-5 of the Specification)** and from about 1% by weight to about 35% by weight **(See, for example, page 3, line 6 of the Specification)** of an amorphous second polymer **(See, for example, page 7, line 33 of the Specification)** selected from a polymer having a lower melting point than the biodegradable aliphatic polyester polymer, a polymer having a lower molecular weight than the biodegradable aliphatic polyester polymer and mixtures thereof **(See, for example,**

page 3, lines 7-10 of the Specification).

Grounds of Rejection To Be Reviewed on Appeal

Ground 1

Claims **1-6, 8-12** and **15-28** stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 6,268,434 to Tsai et al. (hereinafter "the Tsai '434 patent").

Ground 2

Claims **1-6, 8-12** and **15-28** stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,976,694 to Tsai et al. (hereinafter "the Tsai '694 patent").

Ground 3

Claims **1-6, 8-12** and **15-28** stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,506,873 to Ryan et al. (hereinafter "the Ryan patent") in view of the Tsai '434 patent.

Ground 4

Claims **7, 13** and **14** stand rejected under 35 U.S.C. § 103(a) over the Ryan patent in view of the Tsai '434 patent and further in view of U.S. Patent Publication No. 2002/0111596 A1 to Fletcher et al. (hereinafter "the Fletcher publication").

Argument

The claims on appeal

Claims 1-28 are on appeal, and are set forth in the enclosed APPENDIX 1.

Prior art relied on by the Examiner

In the Final Rejection, the Examiner has relied on the following art:

U.S. Patent No. 6,268,434 to Tsai et al.
U.S. Patent No. 5,976,694 to Tsai et al.
U.S. Patent No. 6,506,873 to Ryan et al.
U.S. Patent Publication No. 2002/0111596 A1 to Fletcher et al.

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Ground 1 – Rejection of Claims 1-6, 8-12 and 15-28 Under 35 U.S.C. §102(b) Over U.S. Patent No. 6,268,434 to Tsai et al. (Hereinafter "the Tsai '434 patent"):

Question Presented for Review:

Has the Examiner met the burden of establishing anticipation?

In order to anticipate, a reference must teach each and every element of the claimed invention. The Tsai '434 patent does not teach each and every element of the claimed invention. In particular, the Tsai '434 patent does not teach a polymer blend that includes a second polymer that is amorphous. This is an element of each of independent claims 1, 25 and 26.

In the Office Action dated August 12, 2005, the Examiner explains that she is equating the poly(lactic acid) polymer of the Tsai '434 patent to the second polymer of the present invention. In the Final Office Action mailed January 30, 2006, the Examiner relies on the paragraph at Col. 12, lines 17-38 of the Tsai '434 patent as disclosing that the poly(lactic acid) polymer is amorphous. This portion of the Tsai '434 patent is provided below:

Typical poly(lactic acid) polymer materials often undergo heat shrinkage during downstream thermal processing. The heat-shrinkage mainly occurs due to the thermally-induced chain relaxation of the polymer segments in the amorphous phase and incomplete crystalline phase. To overcome this problem, it is generally desirable to maximize the crystallization of the poly(lactic acid) polymer material before the bonding stage so that the thermal energy goes directly to melting rather than to allow for chain relaxation and reordering of the incomplete crystalline structure. The typical solution to this problem is to subject the material to a heat-setting treatment. As such, when prepared materials, such as fibers, are subjected to heat-setting upon reaching a bonding roll, the fibers won't substantially shrink because such fibers are already fully or highly oriented. The present invention alleviates the need for this additional processing step because of the morphology of the multicomponent fiber. In general, the addition of the polybutylene succinate polymer, the polybutylene succinate adipate polymer, or a mixture of such polymers, and the wetting agent decrease the heat shrinkage of a multicomponent fiber as compared to a fiber that is prepared from only poly(lactic acid) polymer.

In one embodiment of the present invention, it is desired that the nonwoven material utilize a thermoplastic composition or a multicomponent fiber which exhibits an amount of shrinking, at a temperature of about 90° C., that is beneficially less than about 15 percent, more beneficially less than about 10 percent, and suitably less than about 5 percent, wherein the amount of shrinking is based upon the difference between the initial and final lengths of the fiber divided by the initial length of the fiber multiplied by 100. The method by which the amount of shrinking that a fiber exhibits may be determined is included in the Test Methods section herein.

In one embodiment of the present invention, it is desired

Lines 17-21 above read "Typical *poly(lactic acid) polymer* materials often undergo heat shrinkage during downstream thermal processing. The heat-shrinkage mainly occurs due to the thermally-induced chain relaxation of the polymer segments in the *amorphous phase* and incomplete crystalline phase." (Emphasis Added). This is the exact language relied upon by the Examiner as disclosing that a second polymer in a blend is amorphous. Appellants contend that this is not the meaning of the cited language. Appellants' interpretation is supported by the content of the remainder of the paragraph. The next sentence, at lines 21-26, reads "To overcome this problem *[that is, the problem of heat shrinkage]*, it is generally desirable to *maximize the crystallization of the poly(lactic acid) polymer material* before the bonding stage so that the thermal energy goes directly to melting rather than to

allow for chain relaxation and reordering of the incomplete crystalline structure." (Bracketed Language and Emphasis Added). The following two sentences, at lines 26-31, describe the conventional solution for maximizing the crystallization of the poly(lactic acid) polymer to prevent heat shrinkage: "The typical solution to this problem is to subject the material to a heat-setting treatment. As such, when prepared materials, such as fibers, are subjected to heat-setting upon reaching a bonding roll, the fibers won't substantially shrink because such fibers are already fully or highly oriented." The remainder of the paragraph, at lines 31-38, describes the solution to the problem of heat shrinkage provided by the invention of the Tsai '434 patent. The need for the conventional processing step of heat-setting is eliminated because of the morphology of the fibers of the Tsai '434 patent. Specifically, the polybutylene succinate polymer, the polybutylene succinate adipate polymer and the wetting agent decrease the heat shrinkage of the multicomponent fiber compared to a fiber made only from poly(lactic acid) polymer. This language of the Tsai '434 patent does not really indicate one way or the other whether the poly(lactic acid) polymer component of the fiber is crystallized or not; the language simply provides that the multicomponent nature reduces the heat shrinkage that was previously a problem with single component fibers. Therefore, the language is insufficient to be the basis for disclosure of a second polymer in a blend being amorphous. For at least this reason, the Tsai '434 patent does not disclose each and every element of independent claims 1, 25 and 26 of the present invention. Dependent claims 2-6, 8-12, 15-24 and 27-28 are also patentable over the Tsai '434 patent for at least the reason that they depend from independent claims 1 and 26. Therefore, Appellants respectfully request that the rejection be reversed with respect to claims 1-6, 8-12 and 15-28.

Ground 2 – Rejection of Claims 1-6, 8-12 and 15-28 Under 35 U.S.C. §102(b) Over U.S. 5,976,694 to Tsai et al. (Hereinafter "the Tsai '694 patent"):

Question Presented for Review:

Has the Examiner met the burden of establishing anticipation?

In order to anticipate, a reference must teach each and every element of the claimed invention. The Tsai '694 patent does not teach each and every element of the claimed invention. In particular, the Tsai '694 patent does not teach a polymer blend that includes a biodegradable aliphatic polyester polymer. This is an element of each of independent claims 1, 25 and 26.

The Tsai '694 patent relates to compositions that include a "water-sensitive polymer". In the Office Action mailed August 12, 2005, the Examiner equates the "water-sensitive polymers" of the Tsai '694 patent with the biodegradable aliphatic polyester polymers of the present invention. The two types of

polymers are not the same. The Tsai '694 patent discloses that the water-sensitive polymer can be a copolyester and discloses desirable functional characteristics of the water-sensitive polymer as well as specific examples at Col. 3, line 53 to Col. 4, line 7 of the Tsai '694 patent. However, none of the polymers described as being suitable water-sensitive polymers in the Tsai '694 patent are the same as the biodegradable aliphatic polyester polymers of the present invention (e.g. See page 7, lines 13-21 of the Specification as filed for the present application). In the Final Office Action mailed January 30, 2006, the Examiner indicates his disagreement with Appellants' argument because "Tsai et al. teach the use of aliphatic polyester polymer polylactide (PLA) (col. 4, lines 9-11)". (See para. 8 on page 3 of the Final Office Action mailed January 30, 2006.) Indeed, the Tsai '694 patent does disclose compositions that "contain at least one additional polymer selected from polylactide (PLA), polyolefin-grafted with one or more polar groups, such as maleic anhydride (MA), and other aliphatic polyesters." (See Col. 4, lines 9-13 of the Tsai '694 patent.) However, polylactide polymer is not disclosed as a suitable water-sensitive polymer; it is disclosed as an "additional" polymer. If the Examiner would like to equate the polylactide polymer disclosed in the Tsai '694 patent to the biodegradable aliphatic polyester polymer of the present invention, that may be reasonable, but then the Examiner has not provided how the Tsai '694 patent discloses the second polymer that is amorphous. Therefore, the Tsai '694 patent fails to disclose the biodegradable aliphatic polyester polymer of the present invention or alternatively, the second polymer that is amorphous. For at least this reason, the Tsai '694 patent does not disclose each and every element of independent claims 1, 25 and 26 of the present invention. Dependent claims 2-6, 8-12, 15-24 and 27-28 are also patentable over the Tsai '694 patent for at least the reason that they depend from independent claims 1 and 26. Therefore, Appellants respectfully request that the rejection be reversed with respect to claims 1-6, 8-12 and 15-28.

Ground 3 – Rejection of Claims 1-6, 8-12 and 15-28 Under 35 U.S.C. §103(a) Over U.S. 6,506,873 to Ryan et al (Hereinafter "the Ryan patent") In View of U.S. 6,286,434 to Tsai et al.

Question Presented for Review:

Has the Examiner met the burden of establishing prima facie obviousness?

In order to establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143.

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Appellants respectfully submit that neither the Ryan patent nor the Ryan patent in view of the Tsai '434 patent teach or suggest all of the limitations of the invention as claimed and therefore, a *prima facie* case of obviousness has not been established. As already described herein, each of independent claims 1, 25 and 26 relates, at least in part, to a polymer blend that includes a second polymer that is amorphous. For the reasons stated above, the Tsai '434 patent does not disclose a second polymer that is amorphous. The Ryan patent does not cure this deficiency. The Examiner has not identified any teaching or suggestion in the Ryan patent of a polymer blend including a biodegradable aliphatic polyester polymer and a second polymer that is amorphous. Therefore, neither the Ryan patent alone nor the combination of the Ryan patent and the Tsai '434 patent teaches or suggests all of the limitations of the invention as claimed. Dependent claims 2-6, 8-12, 15-24 and 27-28 are also patentable over the Ryan patent in view of the Tsai '434 patent for at least the reason that they depend from independent claims 1 and 26. Appellants respectfully request that the rejection be reversed with respect to claims 1-6, 8-12 and 15-28.

Ground 4 – Rejection of Claims 7, 13 and 14 Under 35 U.S.C. §103(a) Over U.S. 6,506,873 to Ryan In View of U.S. 6,268,434 to Tsai et al. and Further In View of U.S. Patent Publication No. 2002/011596 A1 to Fletcher et al. (Hereinafter "the Fletcher publication") :

Question Presented for Review:

Has the Examiner met the burden of establishing prima facie obviousness?

In the Office Action mailed August 12, 2005 and with respect to claims 7, 13 and 14, the Examiner acknowledges that the Ryan patent and the Tsai '434 patent do not disclose a polymer blend including a second polymer which is amorphous and includes a polyalphaolefin. The Examiner believes the Ryan patent teaches the use of poly-caprolactone. The Examiner also believes the Fletcher publication teaches material suitable for a flushable absorbent assembly and teaches the use of amorphous polyalphaolefin or a poly-caprolactone. The Examiner believes therefore, because these two polymers were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the poly-caprolactone taught by the Ryan patent for polyalphaolefin. Appellants submit that claims 7, 13 and 14 are patentable over the Ryan patent in view of the Tsai '434 patent for at least the reason that they depend from independent claim 1, which is patentable over this combination. The Fletcher publication does not cure the lack of disclosure of a polymer blend including a second polymer which is amorphous. Further, in neither the Office Action mailed August 12, 2005 nor the Final Office Action mailed January 30, 2006 has the Examiner explained how this combination of references teaches or suggests the following features of claim 13:

(1) "a polylactide having a D-lactide isomer content less than about 3% by weight, based on the weight of the polylactide"; (2) "the blend comprises from about 85 -98 % by weight of the polylactide"; and (3) "and from about 2-15 % by weight of the polyalphaolefin". Similarly, the Examiner has not explained how the combination of references teaches or suggests the following features of claim 14: (1) "the biodegradable polymer comprises a polylactide having less than about 3% by weight of a D-lactide isomer"; (2) "the second polymer comprises a polylactide having a D-lactide isomer content in the range of about 3-9% by weight, based on the weight of the polylactide"; and (3) "the blend comprises from about 65-75 % by weight of the polylactide and from about 25-35 % by weight of the polyalphaolefin". Therefore, the Examiner has failed to prove a *prima facie* case of obviousness because the Examiner has not provided how the combination of the Ryan patent, the Tsai '434 patent and the Fletcher publication teach or suggest every element of the invention as claimed in dependent claims 7, 13 and 14. For at least these reasons, Appellants respectfully submit that claims 7, 13 and 14 are patentable over the Ryan patent and the Tsai '434 patent in view of the Fletcher publication and request that the rejection be reversed.

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Conclusion

For the reasons stated above, it is Appellants' position that the Examiner's rejection of claims has been shown to be improper and should be **reversed** by the Board.

The $500.00 fee (fee code 1402), pursuant to 37 C.F.R. 41.20(b)(2) for filing this Appeal Brief was submitted with the Appeal Brief filed August 1, 2006. Any additional prosecutional fees which are due may be charged to deposit account number 11-0875.

The undersigned may be reached at: (920) 721-2433.

Respectfully submitted,

MARK G. REICHMANN ET AL.

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CERTIFICATE OF TRANSMISSION

I, Judy Garot, hereby certify that on September 6, 2006 this document is being facsimile transmitted to the United States Patent and Trademark Office, Fax No. (571) 273-8300.

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Claims Appendix

The claims on appeal are:

1. (original) A biodegradable nonwoven web prepared from a polymer blend comprising from about 65% by weight to about 99% by weight of a biodegradable aliphatic polyester polymer and from about 1% by weight to about 35% by weight of a second polymer which is amorphous and is selected from the group consisting of a polymer having a lower melting point than the aliphatic polyester polymer, a polymer having a lower molecular weight than the aliphatic polyester polymer and mixtures thereof.

2. (previously presented) The biodegradable nonwoven web of claim 1, wherein the aliphatic polyester comprises at least one polymer selected from polyhydroxy butyrate (PHP), polyhydroxy butyrate-co-valerate (PHBV), polycaprolactane, polybutylene succinate, polybutylene succinate-co-adipate, polyglycolic acid (PGA), polylactide or polylactic acid (PLA), polybutylene oxalate, polyethylene adipate, polyparadioxanone, polymorpholineviones, or polydioxipane-2-one.

3. (original) The biodegradable nonwoven web of claim 2, wherein the aliphatic polyester comprises a polylactide.

4. (original) The biodegradable nonwoven web of claim 3, wherein the polylactide comprises a poly(L-lactide) having a D-isomer, if present, in an amount less than 3%.

5. (original) The biodegradable nonwoven web of claim 4 wherein the polylactide comprises a poly(L-lactide) having a D-isomer, if present, in an amount less than 2%.

6. (original) The biodegradable nonwoven web of claim 1, wherein the second polymer comprises a biodegradable aliphatic polyester, a polyolefin, a polyamide, a terpene resin, ethylene copolymers derived from ethylene and a non-hydrocarbon containing monomer or a wood rosin.

7. (original) The biodegradable nonwoven web of claim 6, wherein the second polymer comprises a polyalphaolefin.

8. (original) The biodegradable nonwoven web of claim 6, wherein the second polymer comprises a biodegradable aliphatic polyester.

9. (original) The biodegradable nonwoven web of claim 6, wherein the second polymer comprises a biodegradable aliphatic polyester having a melting point at least 10 °C below the melting point of the first biodegradable aliphatic polyester.

10. (original) The biodegradable nonwoven web of claim 1, wherein the nonwoven web is a meltblown nonwoven web, a spunbond nonwoven web, a bonded carded web or an airlaid nonwoven web.

11. (original) The biodegradable nonwoven web of claim 10, wherein the nonwoven web is a spunbond nonwoven web.

12. (original) The biodegradable nonwoven web of claim 1, wherein the nonwoven web comprises multicomponent fibers, wherein at least a portion of an outer surface of the multicomponent fibers comprises the polymer blend.

13. (original) The biodegradable nonwoven web of claim 1, wherein the nonwoven web is a spunbond nonwoven web, the biodegradable polymer comprises a polylactide having a D-lactide isomer content less than about 3% by weight, based on the weight of the polylactide, the second polymer comprises a polyalphaolefin, the blend comprises from about 85 -98 % by weight of the polylactide and from about 2-15 % by weight of the polyalphaolefin.

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14. (original) The biodegradable nonwoven web of claim 1, wherein the nonwoven web is a spunbond nonwoven web, the biodegradable polymer comprises a polylactide having less than about 3% by weight of a D-lactide isomer, the second polymer comprises a polylactide having a D-lactide isomer content in the range of about 3-9% by weight, based on the weight of the polylactide, the blend comprises from about 65-75 % by weight of the polylactide and from about 25-35 % by weight of the polyalphaolefin.

15. (original) A personal care product comprising the nonwoven web of claim 1 as a component of the product.

16. (original) The personal care product of claim 15, wherein the personal care product is a diaper.

17. (original) The personal care product of claim 15, wherein the personal care product is a feminine hygiene pad.

18. (original) The personal care product of claim 15, wherein the personal care product is a training pant.

19. (original) A medical garment comprising the nonwoven web of claim 1.

20. (original) The medical garment of claim 19, wherein the medical garment is a gown.

21. (original) The medical garment of claim 19, wherein the medical garment is a face mask

22. (original) A sterile wrap comprising the nonwoven web of claim 1.

23. (original) A wiper comprising the nonwoven web of claim 1.

24. (original) A filter comprising the nonwoven web of claim 1.

25. (previously presented) A method of increasing the tear strength of a biodegradable nonwoven web prepared from a biodegradable aliphatic polyester polymer, said method comprising forming a blend of a biodegradable aliphatic polyester polymer and a polymer which is amorphous selected from the group consisting of a polymer having a lower melting point than the biodegradable aliphatic polyester polymer, a polymer having a lower molecular weight than the biodegradable aliphatic polyester polymer and mixtures thereof with the biodegradable aliphatic polyester polymer; forming a nonwoven web from the blend; and bonding the nonwoven web.

26. (original) A fiber from a polymer blend comprising from about 65% by weight to about 99% by weight of a biodegradable aliphatic polyester polymer and from about 1% by weight to about 35% by weight of a second polymer which is amorphous and is selected from the group consisting of a polymer having a lower melting point than the aliphatic polyester polymer, a polymer having a lower molecular weight than the aliphatic polyester polymer and mixtures thereof.

27. (original) The fiber of claim 26, wherein the fibers is a staple fiber.

28. (original) The fiber of claim 26, wherein the fiber is a substantially continuous filament.

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Evidence Appendix

No evidence is submitted in conjunction with this Appeal.

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Related Proceedings Appendix

There are no known related proceedings in connection with this Appeal.